

EARTH SCIENCE ENTERPRISE SCIENCE OVERVIEW

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EARTH SCIENCE ENTERPRISE MISSION

“...to develop understanding of the total Earth system, and the effects of natural and human-induced changes on the global environment.”

GOALS

- **Expand scientific knowledge of the Earth system using NASA's unique capabilities from the vantage points of space, aircraft, and *in situ* platforms**
- **Disseminate information about the Earth system**
- **Enable the productive use of the Earth Science Enterprise science and technology in the public and private sectors**

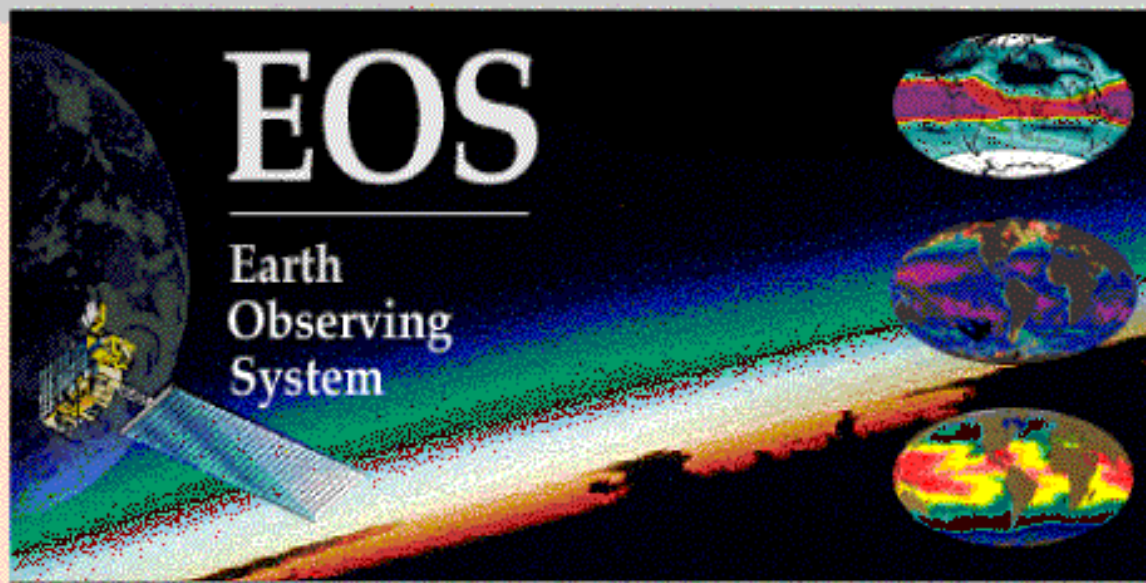
A Solid Research Program in Place to Answer the Most Important Questions (cont'd)

- **Land Cover and Land Use Change Research**
 - What are the nature and extent of land cover and land use change and the consequences for sustained productivity?
- **Seasonal-to-Interannual Climate Variability and Prediction**
 - Can we enable regionally useful forecasts of precipitation and temperature on seasonal-to-interannual time frames?
- **Natural Hazards Research and Applications**
 - Can we learn to predict natural hazards and mitigate natural disasters?
- **Long-term Climate: Natural Variability & Change Research**
 - What are the causes and impacts of long-term climate variability, and can we distinguish natural from human-induced drivers?
- **Atmospheric Ozone Research**
 - How and why are concentrations and distributions of atmospheric ozone changing?

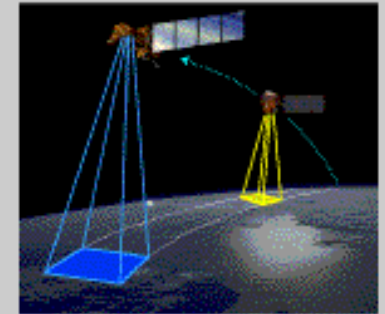
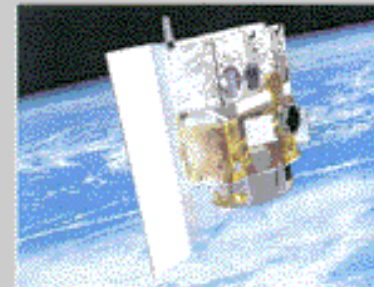
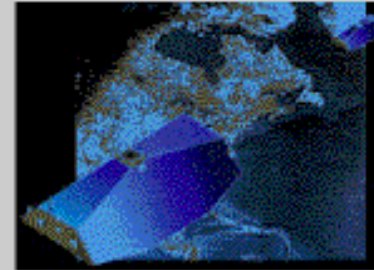
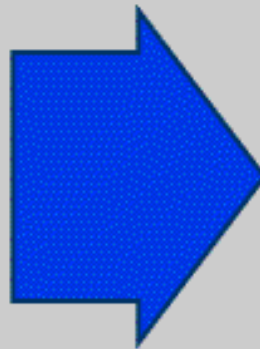
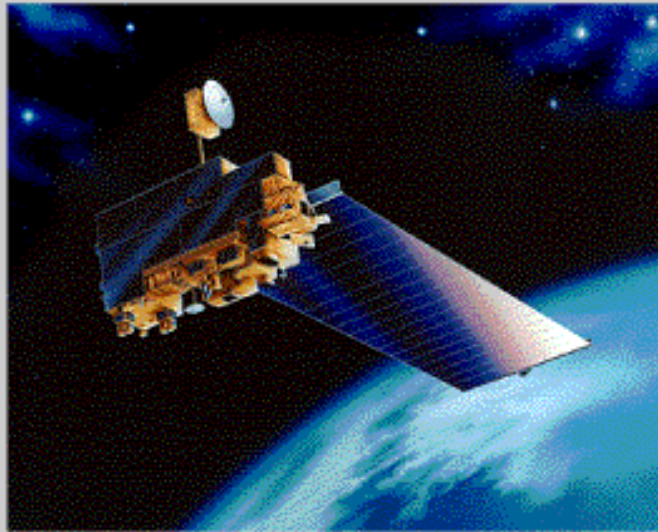
NASA's Unique Contribution is the Global Perspective from Space

Earth Observing System (EOS)

- Launch of EOS-AM-1 in 1998 and Landsat-7 in 1999
- First comprehensive study of interaction between atmosphere, oceans, land and life
- Provides long term data set of key measurements required for the study of global climate change
- Provides an objective, scientific basis for environmental understanding and decision-making
- Extensive international and interagency collaboration
- Instruments and spacecraft of varied sizes and capabilities
- Follow-on spacecraft will incorporate advanced instrument technologies and rapid spacecraft procurements
- Expanded commercial opportunities to reduce cost and increase responsiveness to evolving science requirements



A New Approach to Post-2002 Missions



FEATURES

- Comprehensive technology program
- Use of commercial spacecraft
- Smaller instruments and more single instrument missions
- Enhance collaboration with commercial, interagency, and international partners
- Commercial data purchases where possible

BENEFITS

- 10% reduction in total mission cost from previous Second Series approach
- 20% reduction in total mission cost from First series
- Average cost per mission down from \$725M for 2nd Series to about \$225M
- Opportunity to refine future mission requirements based on learning from 1st series results

	PRIOR	1996	1997	1998	1999	2000	2001	2002
EOS / Pre-EOS	UARS TOPEX/* Poseidon LAGEOS* 1&2 OTD RADARSAT* SSBUV		SeaWiFSi (Data Purchase)	EOS-AM1* LANDSAT-7^ QuikSCAT Orsted (Sunsat)*	ACRIM SAGE III* (METEOR-3M)	EOS-PM1* Jason-1* (w/ France) Seawinds* (ADEOS II-Jpn)	ICESAT TSI* (SCISAT-CSA)	EOS-CHEM1* SAVE (SOLSTICE)
<i>Technology / New Millennium Program Missions</i>					NMP/EO-1 Advanced Land Imager w/ SAC-C (Arg.)		NMP/EO-2 Sparkle (Shuttle mission)	
<i>Earth Probes & Earth System Science Pathfinders</i>	TOMS* (Meteor-3M)	TOMS-EP NSCAT & TOMS (ADEOS-Jpn)*	TRMM* (w/ Japan)			TOMS* (Meteor-3M) ESSP-1/VCL	ESSP-2/ GRACE*	ESSP-3
<i>Shuttle & Space Station- based</i>	ATLAS 1-3 SRL 1&2* LITE	SSBUV SLA	CRISTA-SPAS* SLA/ISIR/ Solcon-1 SOLSE/LORE*	Solcon-2* SLA-3/ CAPL-3	SRTM^			SAGE III (ISS- Mid Incl.) CIMEX*
<i>Build & Launch for NOAA</i>	NOAA-12^ NOAA-14^ GOES-8^ GOES-9^		GOES-10^	NOAA-K^	NOAA-L^ GOES-L^	GOES-M^	NOAA-M^	GOES-N^

* = International collaboration

^ = Interagency collaboration

ε = Commercial collaboration

BOLD = EOS Spacecraft/instrument (1st series)